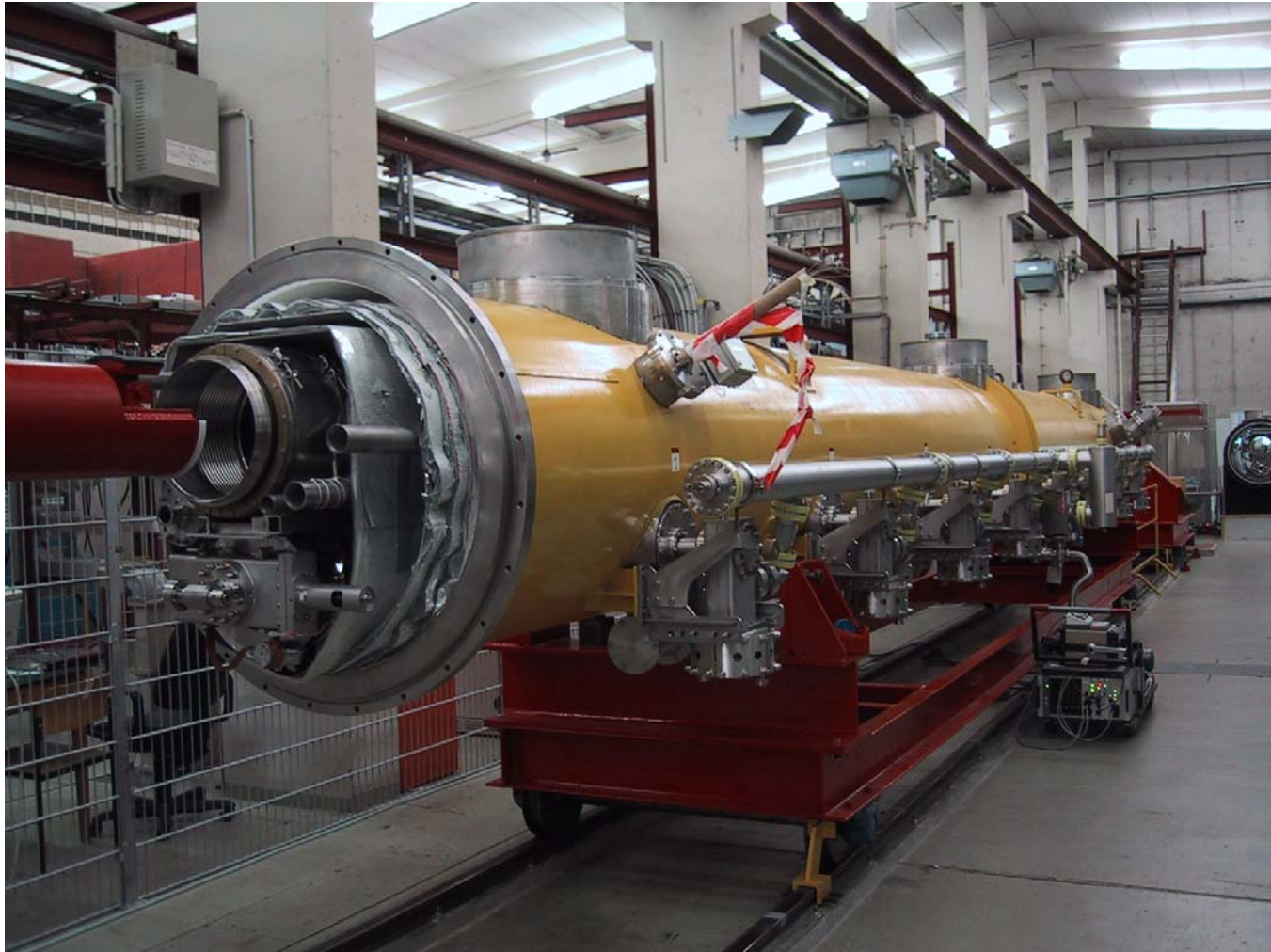


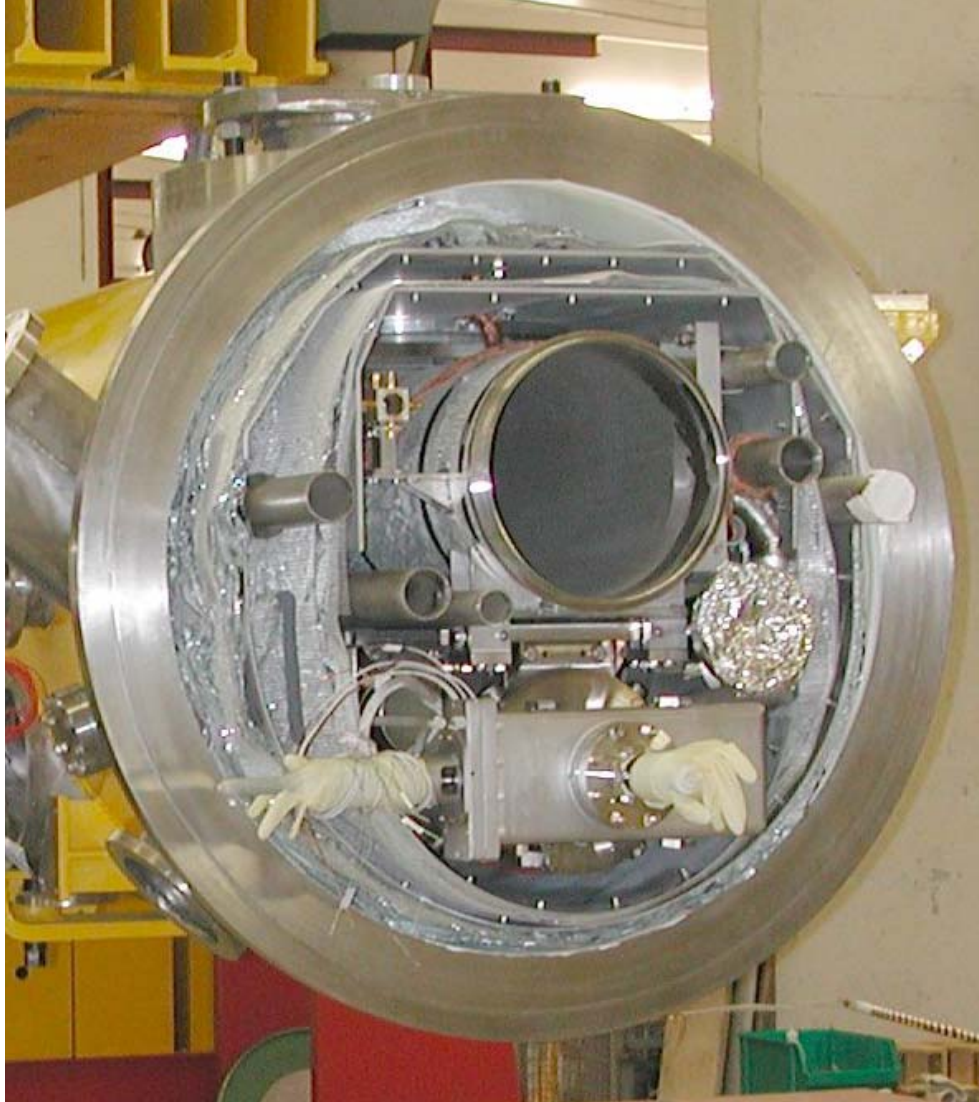
Plans for the ILC cryomodule  
meeting at CERN  
16 - 17 January 2006

Harry Carter and Tom Peterson, Fermilab  
SMTF video conference meeting  
5 January 2006

## TTF cryomodule



# Module end



## CERN meeting purpose

- Type IV Cryomodule (T4CM) design team formation and technical discussions
- Module issues collected by working groups at meetings, including but not limited to
  - SLAC (14 - 16 Oct 2004)
  - KEK (13 - 15 Nov 2004)
  - DESY (6 - 8 Dec 2004)
  - Snowmass (August 2005)
  - SMTF collaboration meeting (5 - 7 Oct 2005)
- Workshop format -- few formal talks

# CERN meeting goals

- Technical
  - Definition of what a T4CM is
  - Identification of a comprehensive list of tasks to be accomplished in working toward the T4CM design
- Organizational
  - Formation of an international T4CM design team
  - Identify who will do what
  - Establish a timeline for T4CM design completion
  - Future meetings---discuss when, where, frequency, etc.

## Additional goals from Chris Adolphsen-- RDR module and cryosystem definition

- Length of cryomodules with and without quads
- External support of cryomodules (e.g. from the floor or ceiling)
- Beamline and insulating vacuum segmentation
- Cryogenic maintenance length and the additional space required between segments
- Space required to convert from cold to warm sections
- Refrigerator spacing, capacities and space requirements



# BCD/RDR versus Type IV

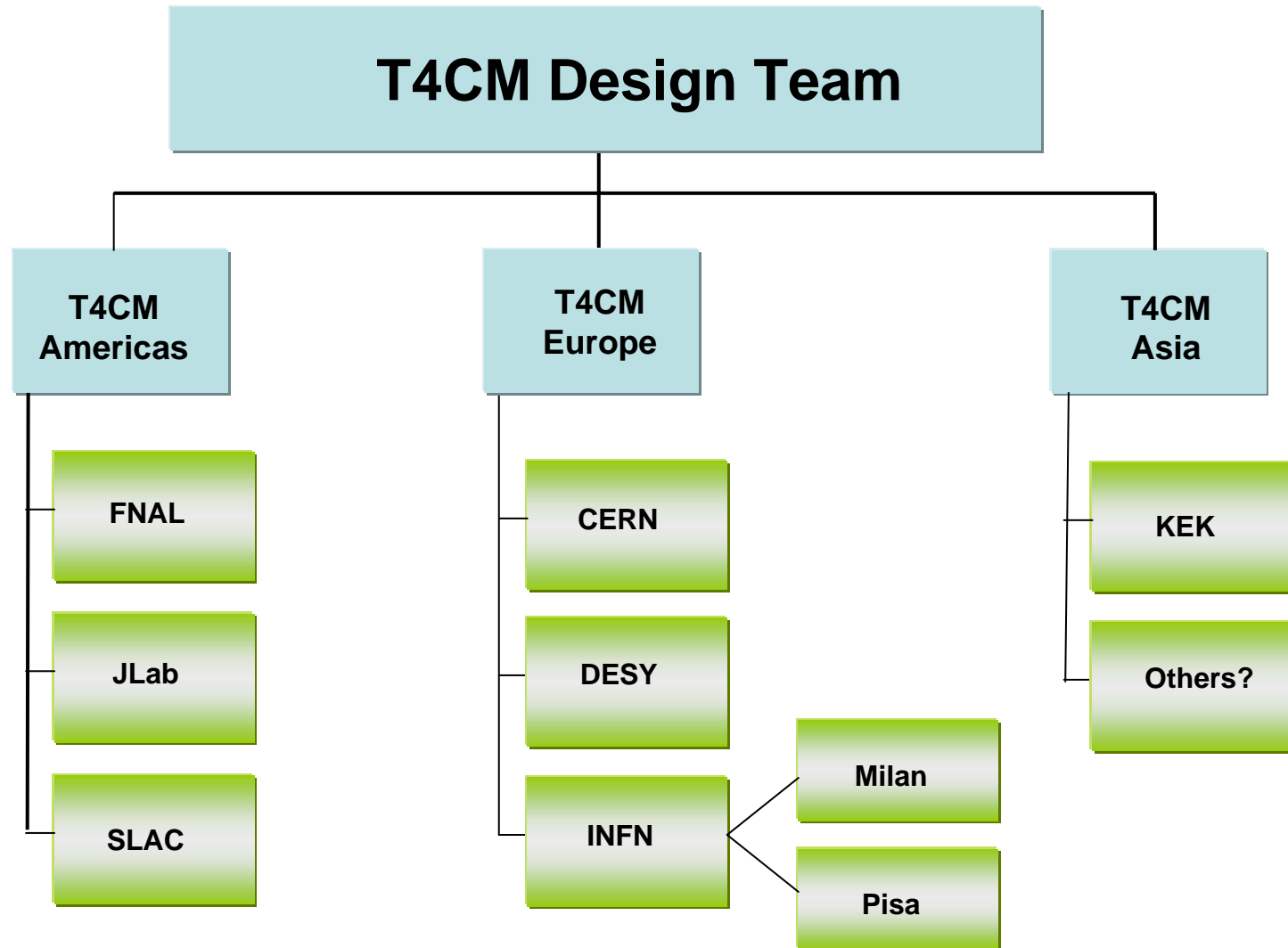
- The module design for the RDR should be well-understood and conservative, in order to have confidence in the cost estimate
- Type IV is a new development, requires design effort, consideration of various options, over a time period of a few years
- These efforts diverge at some point -- BCD/RDR is a fixed reference while we move on with type IV design development
- We will respond to the requests from Chris

# Preliminary draft agenda

- Meeting Agenda:
  - Monday, January 16
    - Introduction and meeting overview H. Carter
    - Organizational issues H. Carter
    - Lunch
    - First draft list of technical issues and tasks T. Peterson
    - Technical Discussions all
  - Tuesday, January 17
    - Technical Discussions all
    - Lunch
    - Continuation of Technical Discussions all
    - Summary and closeout
    - Plans for next meeting
    - Adjourn
- ILC cryogenic system meeting on Wednesday, January 18
- Many thanks to our CERN colleagues for hosting this meeting on very short notice
  - Jean-Pierre Delahaye
  - Vittorio Parma



# International Design Team Formation



# ILC Americas T4CM Design Team

- **Task Manager (“integrator”):**

**T. Peterson**

- Task engineers and scientists:

D. Mitchell: Mechanical design

T. Nicol: Cryostat & supports

M. McGee: Vibration measurement & analysis

S. Tariq: FEA analysis of mechanical  
components (tuners, cavities, etc.)

J. Tompkins: SC quadrupole & correctors

V. Kashikin: SC quadrupole & correctors

J. Weisend: Cryostat & cryogenics

K. Jobe: Cryostat & cryogenics

- Task Designer(s): Contract Designers

- Task Scientific Input: H. Edwards / S. Mishra/ K. Ranjan/ N. Solyak/  
Paul Lebrun / H. Padamsee

**Deliverable: Complete T4CM drawing package ready for procurement by end of CY07**

# Draft list of technical issues and tasks for discussion at CERN

- Design the intercavity connecting flange and bolting arrangement, detail the new spacing.
- Decide on pressure drop criteria and pipe sizes for the modules
- Modify the slow tuner design to allow closer cavity-to-cavity spacing
- Modify the fast tuner design for proper piezo function

## Technical issues and tasks (page 2)

- Design the support details for locating quad/corrector/BPM package under center post, but still hung from 300 mm tube
- Select some possible quadrupole current leads and work out configurations for integration into module.
- Design module end to accommodate the input coupler at the far end of the cryostat
- Module-to-module interconnect design
- Vibrational analysis of the quad and cavity support structure

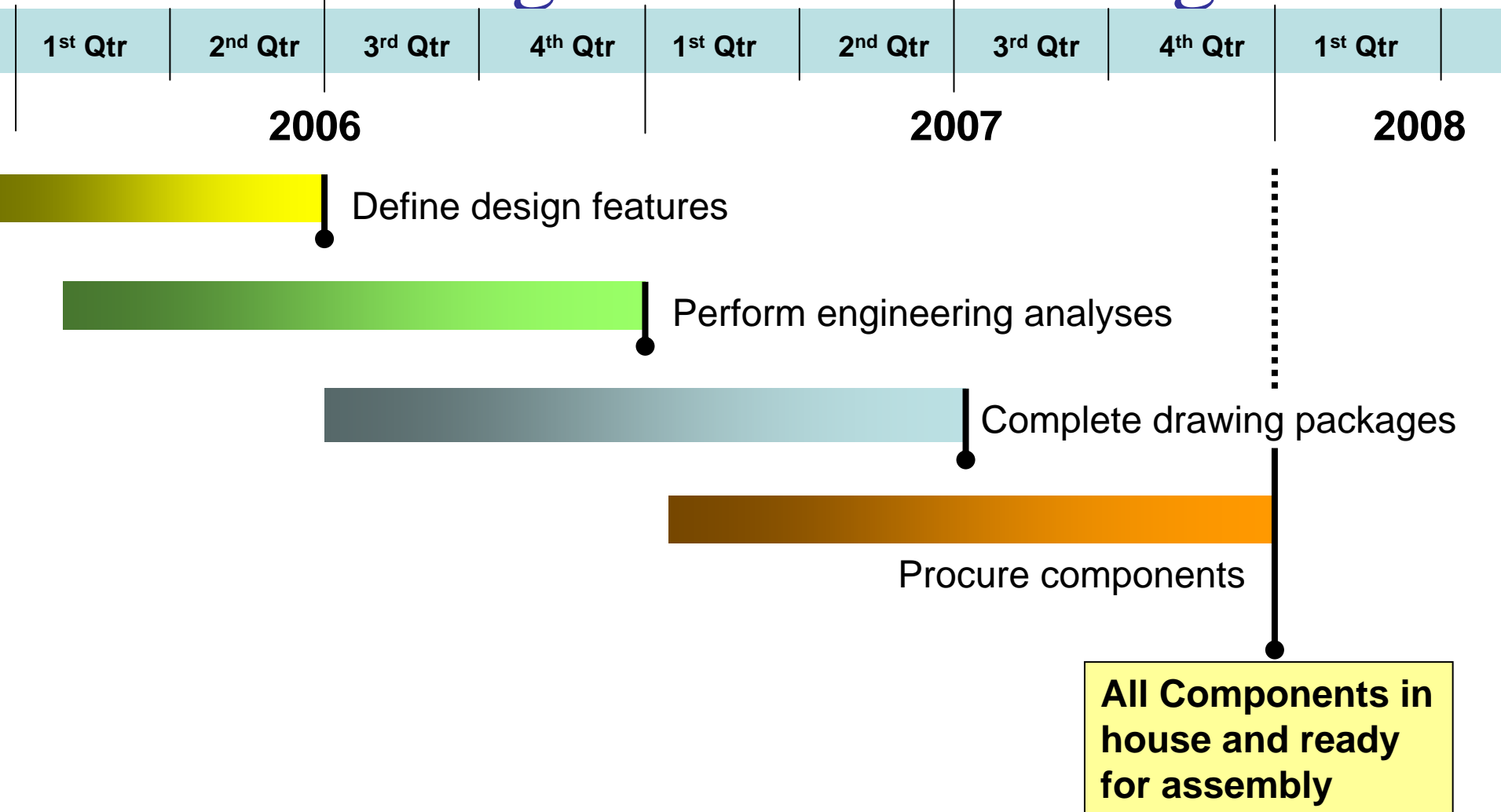
## Technical issues and tasks (page 3)

- Design for stability with shipping, analysis of shipping restraints and loads
- Develop module test plans and module component test plans
- Design of instrumentation for installation into the module
- Possible incorporation of a segment-to-segment “spool” piece
- Conceptual design of separate quad cryostat
- Active mover design

# Some critical open design issues

- **Quad/corrector/BPM package is a major unknown right now and goes into the heart of the module**
- Tuner details, slow and fast, but especially fast tuner
- Vibrational analysis, which will be compared to measurements for verification of the model for future design work
- Development of module and module component test plans
- Verification of cavity positional stability with thermal cycles
- Design of test instrumentation for the module
- Robustness for shipping, analysis of shipping restraints and loads, shipping specifications
- Active quad movers(?) A complication

# Arriving at a T4CM Design





## Type IV probable schedule

- Design module -- 12 - 24 months (2006 - 2007)
  - Magnet/BPM package
  - Tuners, etc.
  - Integrate into module design
- Build and test -- 12 - 18 months (2007 - 2008)
  - In addition to module, need module test stand and test facility!
- Total 2 to 3 1/2 years, depending on scope of work and availability of resources.